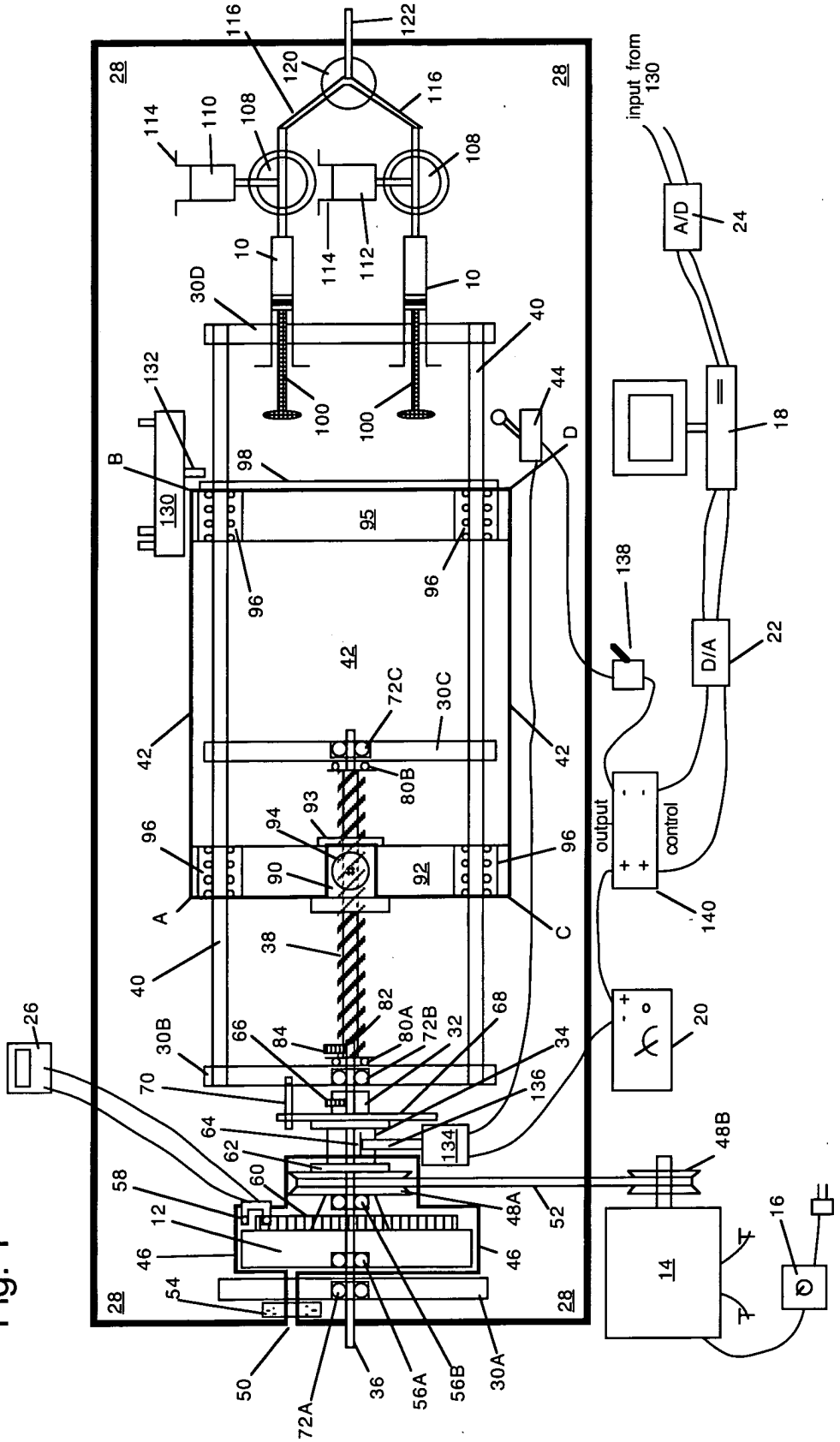


Fig. 1

Fig. 2

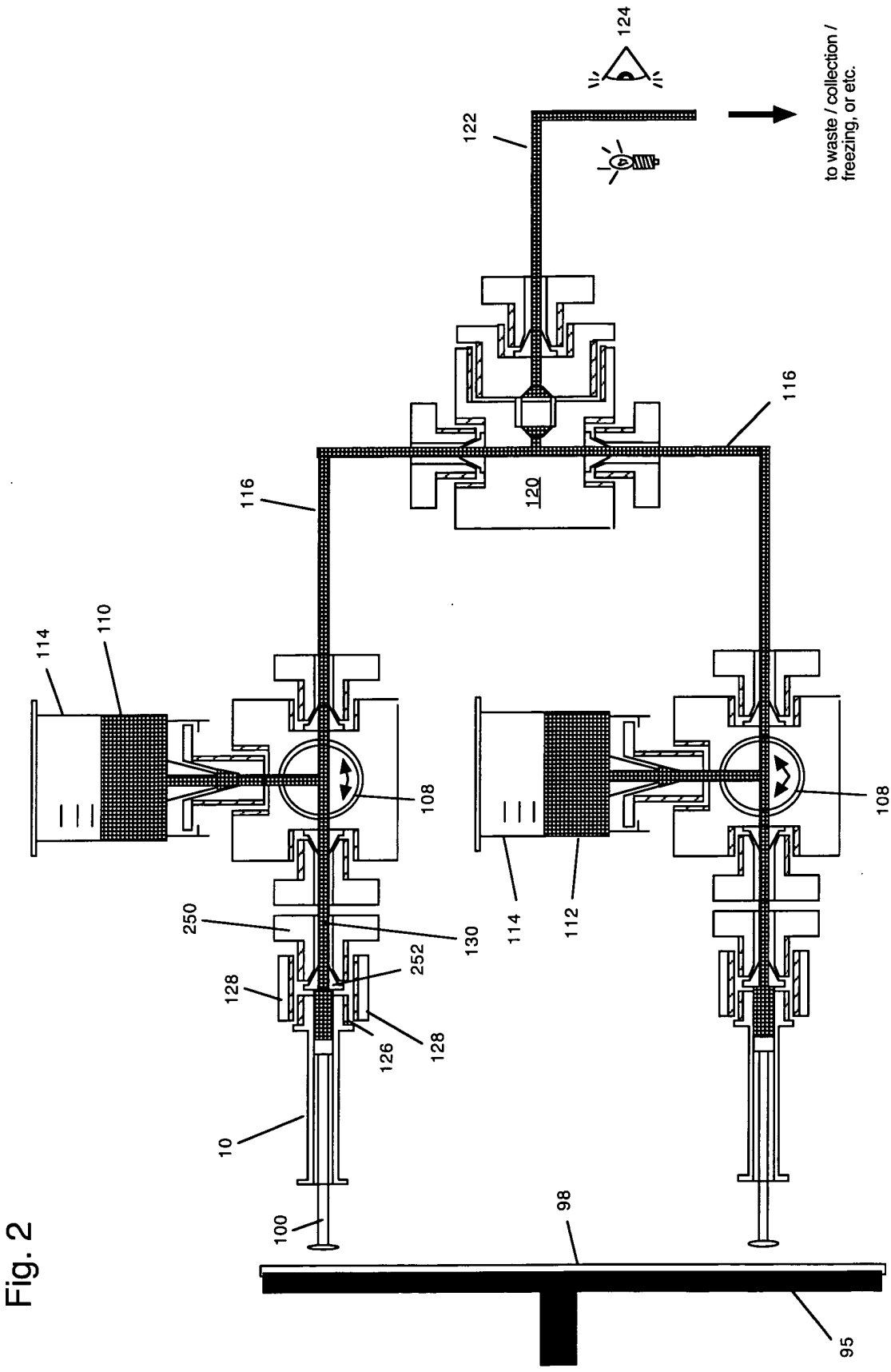

124
122
to waste / collection / freezing, or etc.
116
116
120
114
110
108
108
250
130
252
128
128
126
114
112
10
100
98
95

Fig. 3

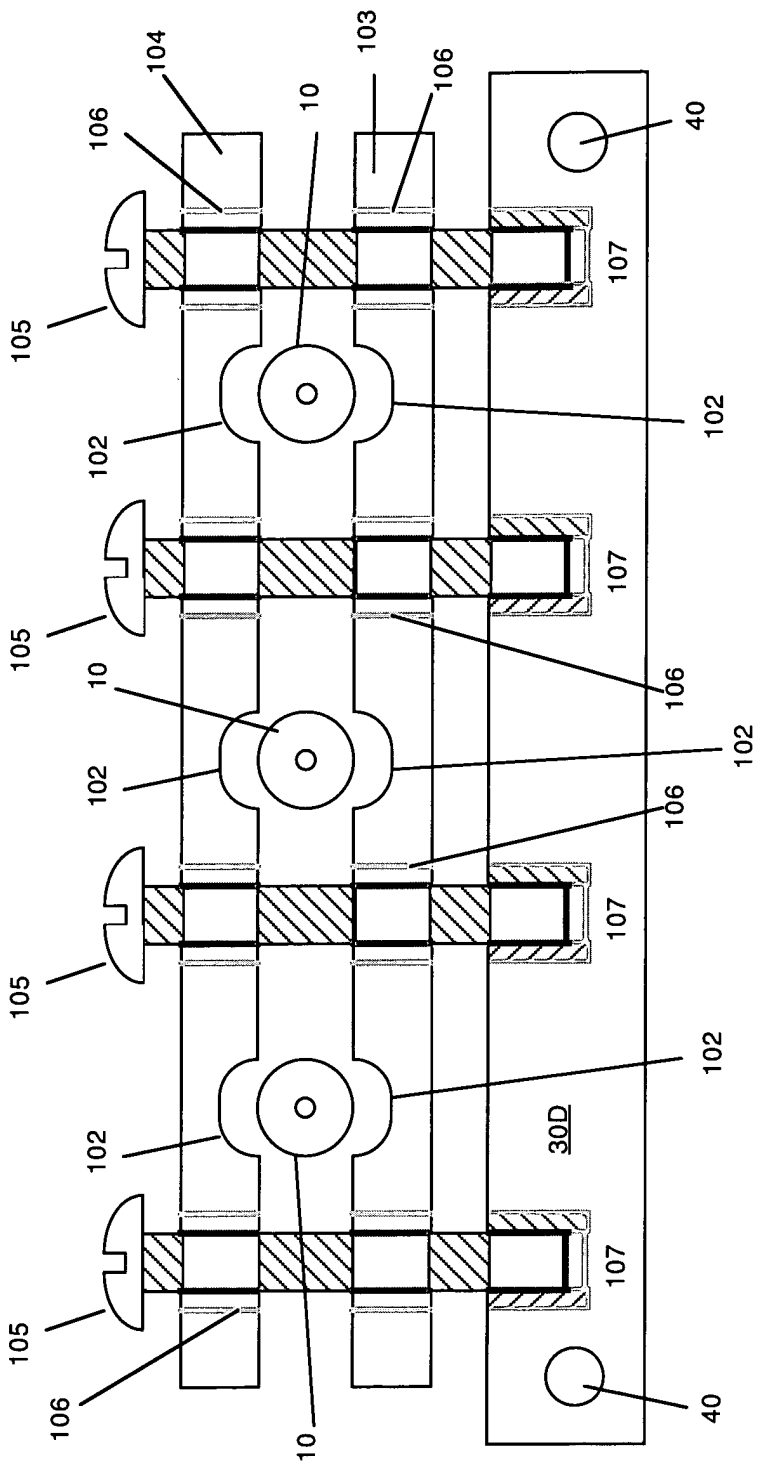

104
106
10
103
106
40
105
107
102
102
105
107
10
102
106
102
105
107
106
102
102
105
107
30D
102
106
10
40

Fig. 4A

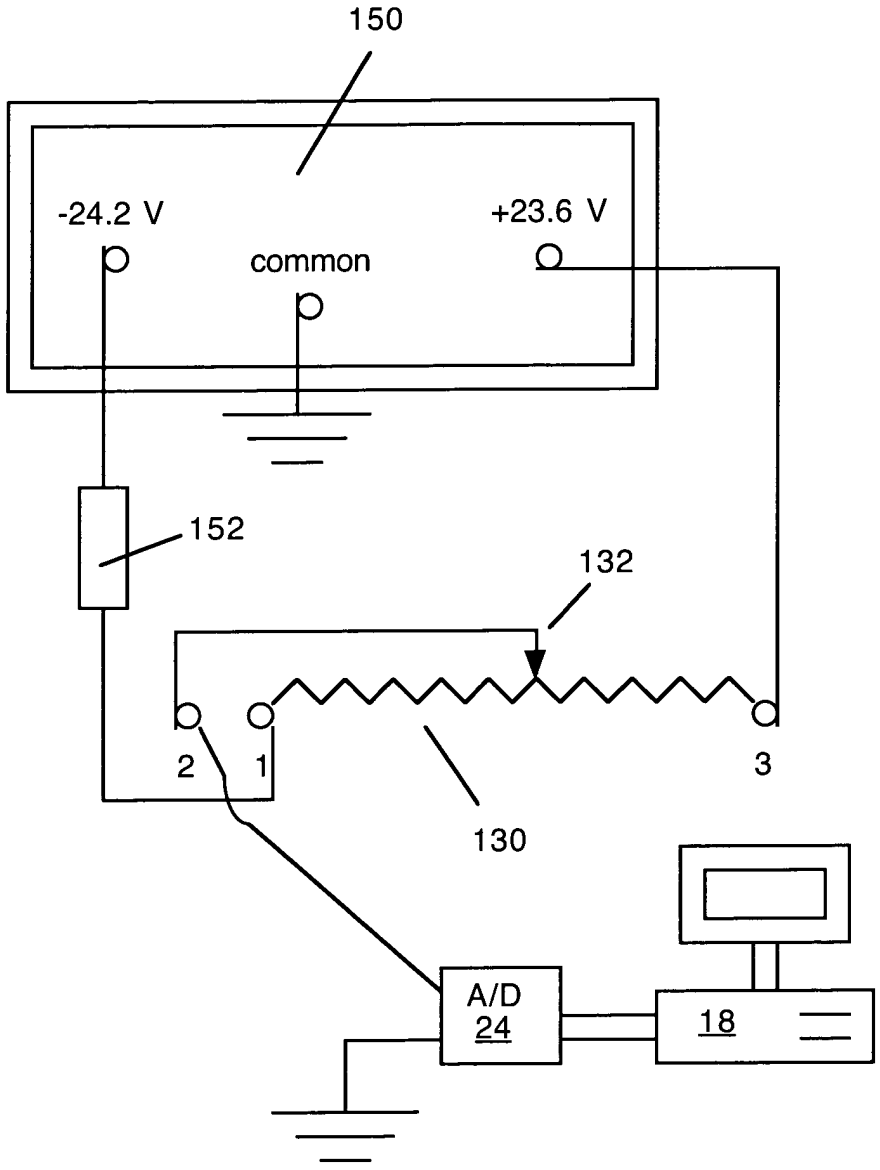


Fig. 4B

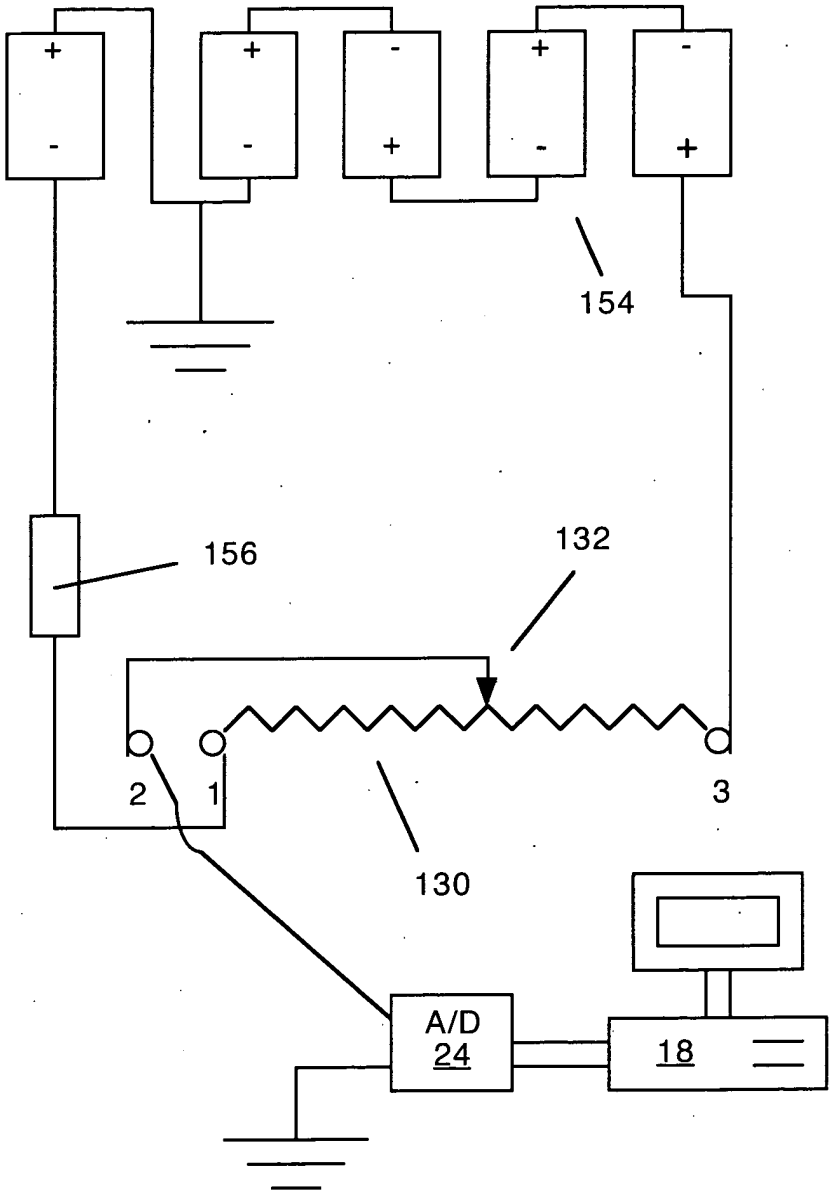


Fig. 5

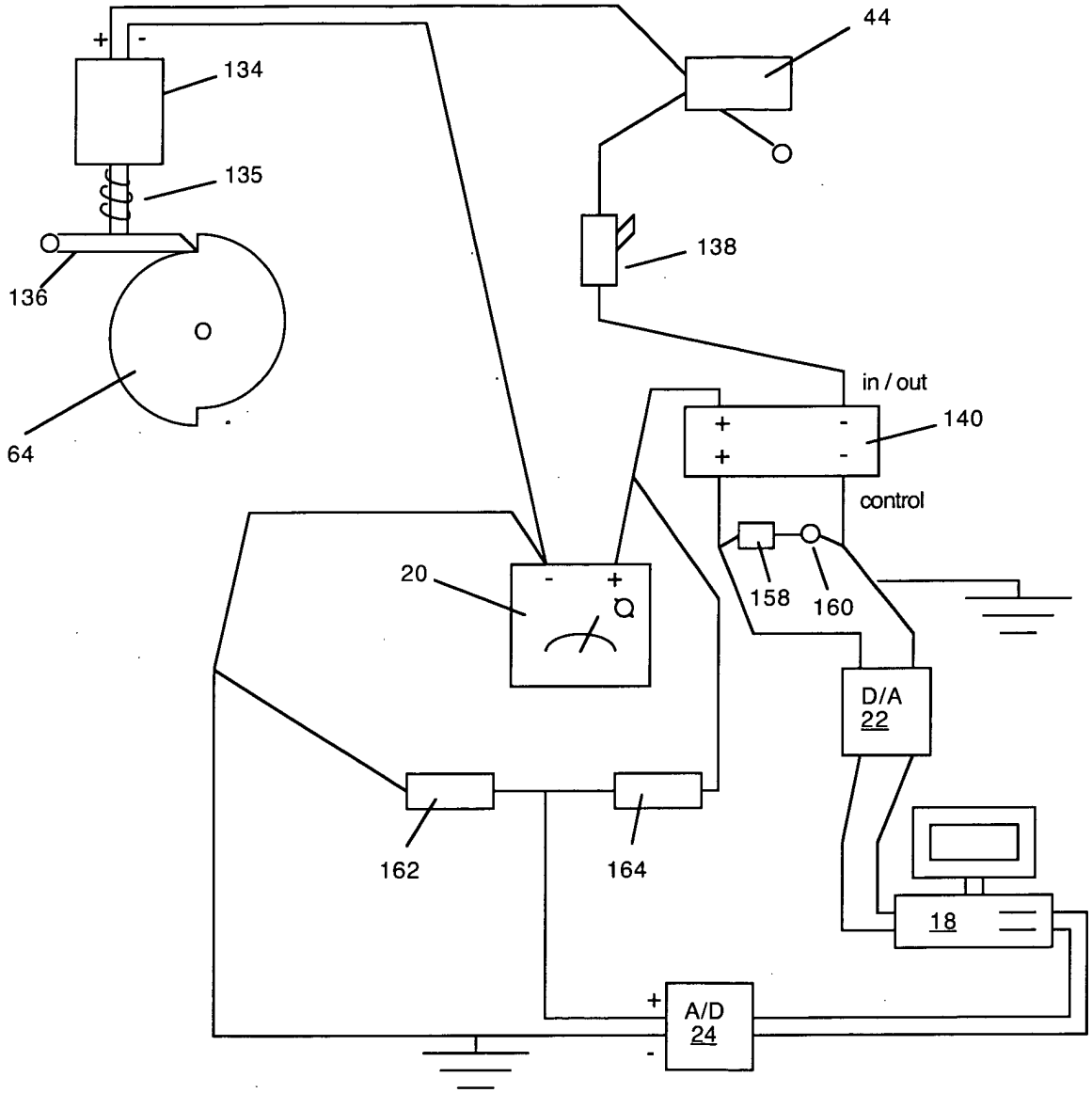

44
+
-
134
135
136
64
138
in / out
140
control
20
158
160
D/A
22
162
164
18
A/D
24

Fig. 6

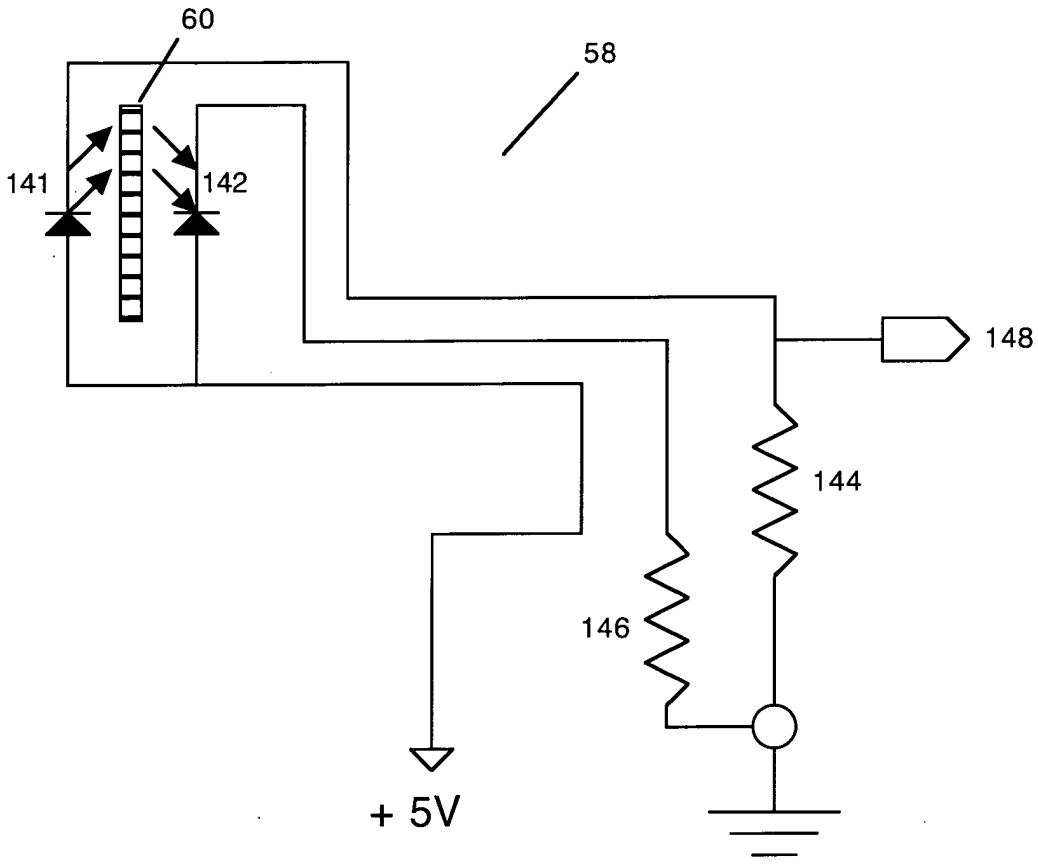


Fig.7A

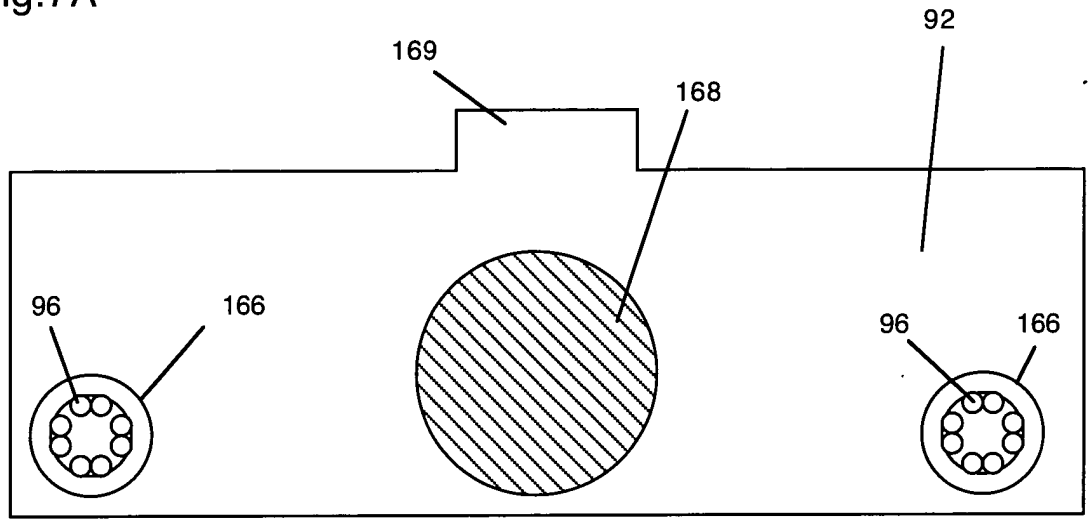


Fig. 7B

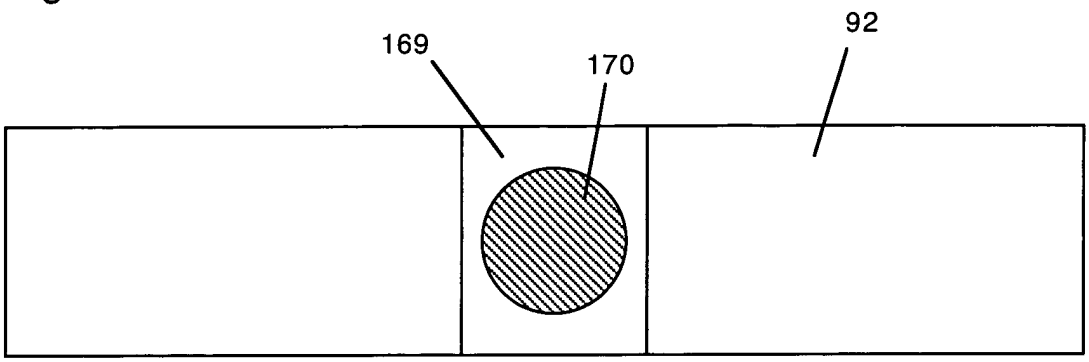


Fig. 7C

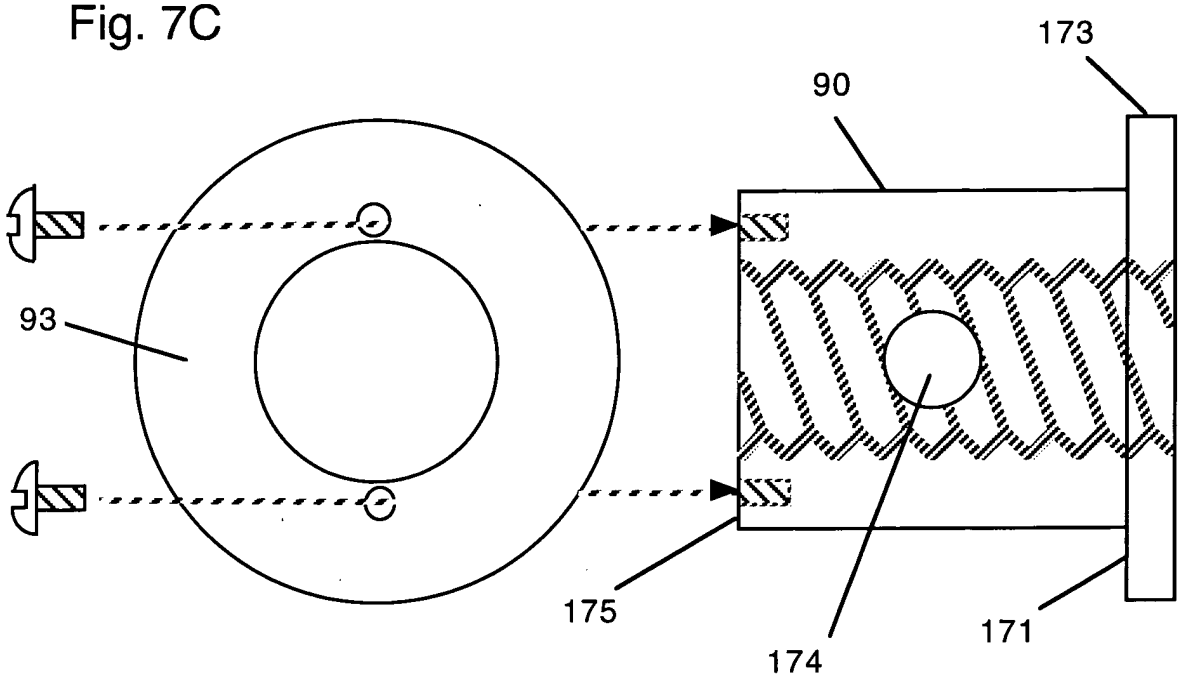


Fig. 7D

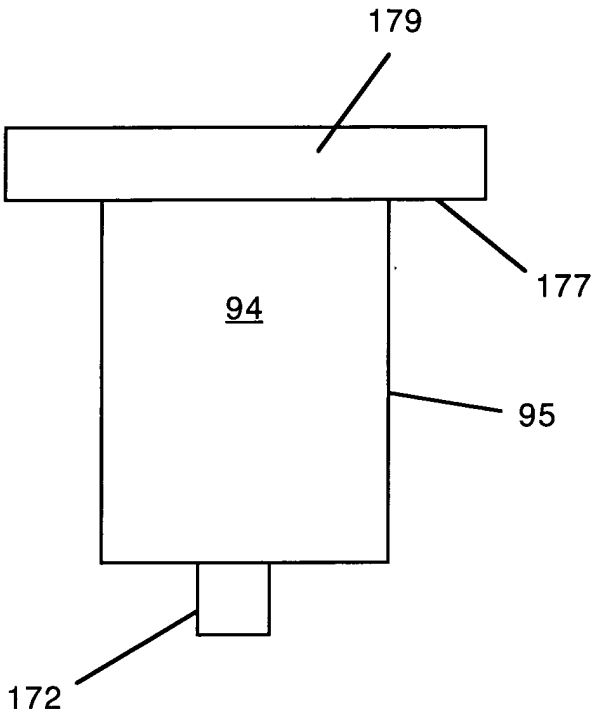


Fig. 7E

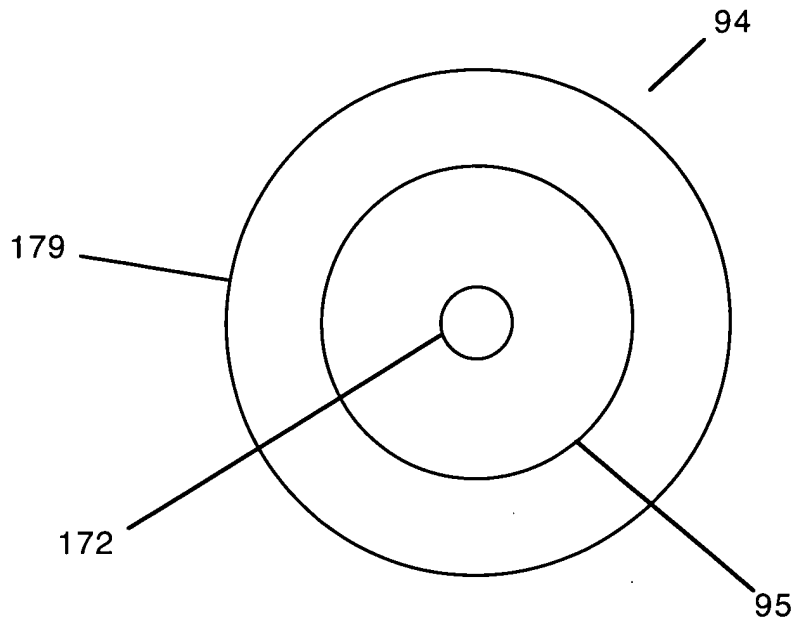


Fig. 8A

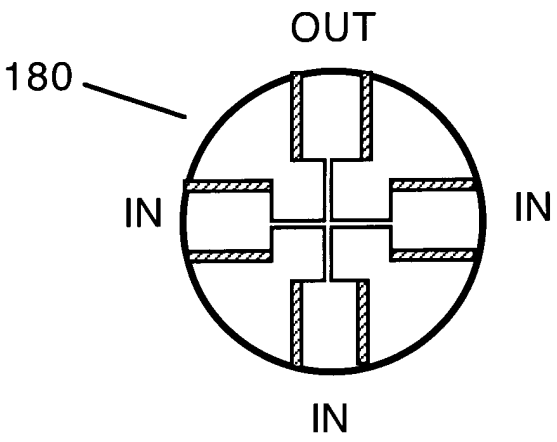


Fig. 8B

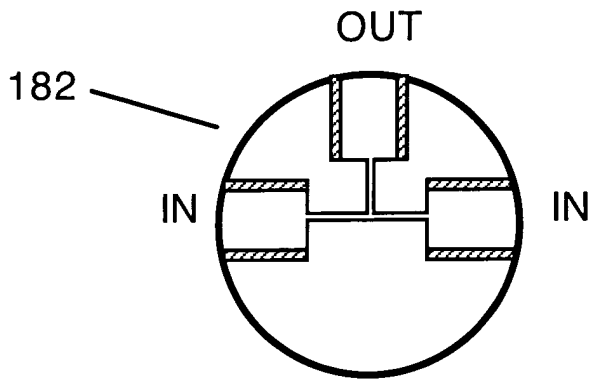


Fig. 8C

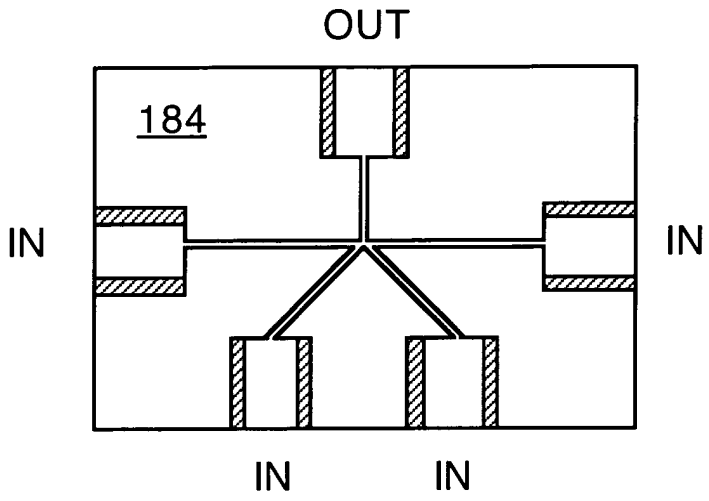


Fig. 8D

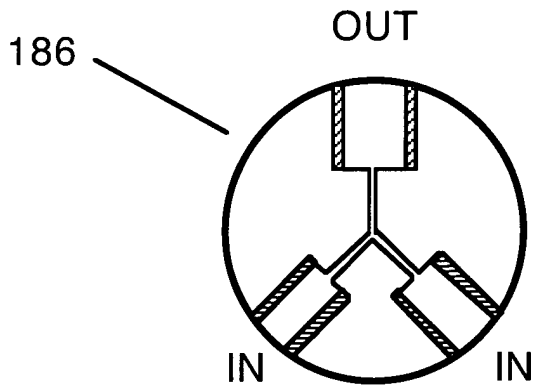


Fig. 8E

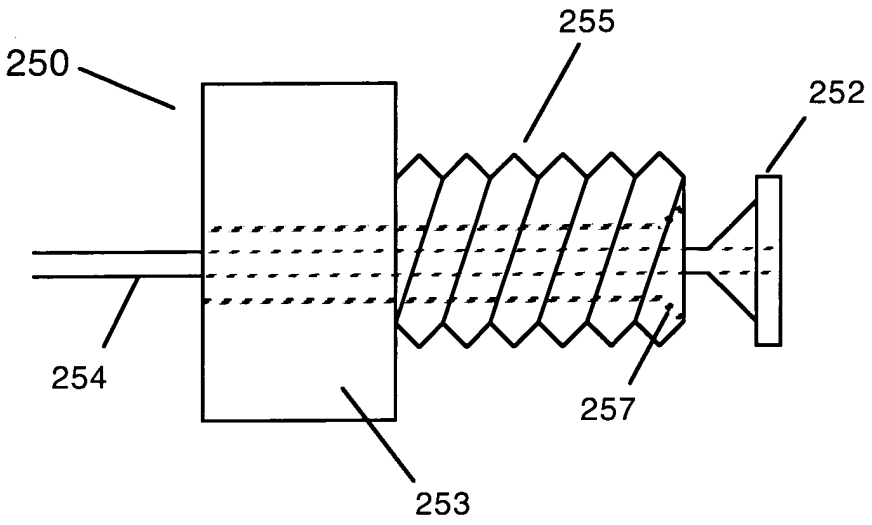


Fig. 9A

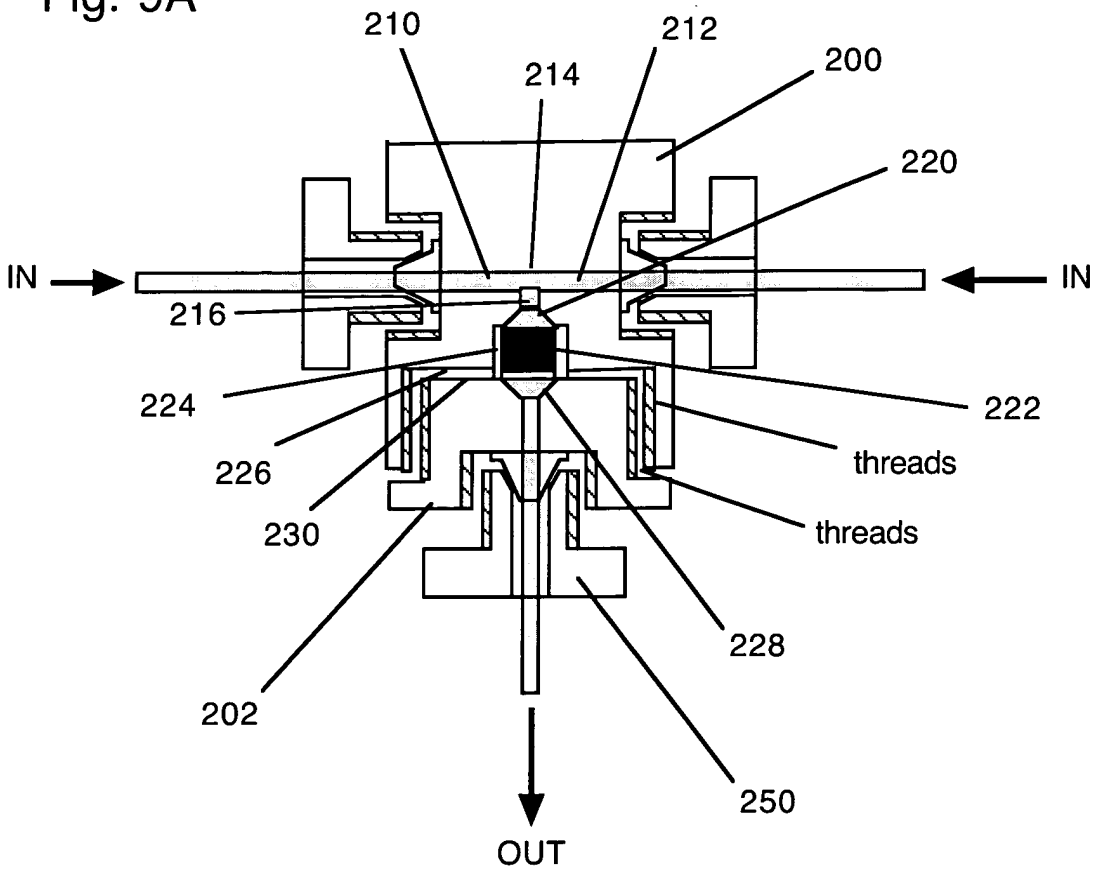

210
212
214
200
220
IN
IN
216
224
222
226
threads
230
threads
228
202
250
OUT

Fig. 9B

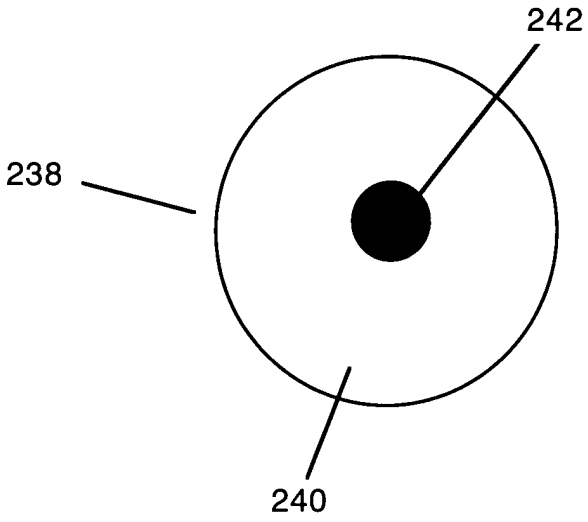


Fig. 9C

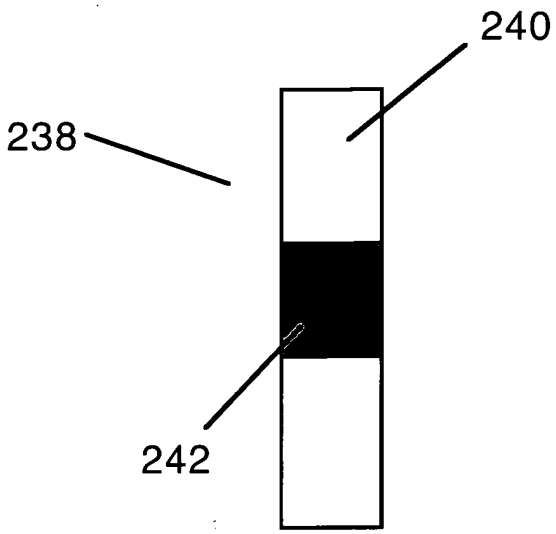


Fig. 9D

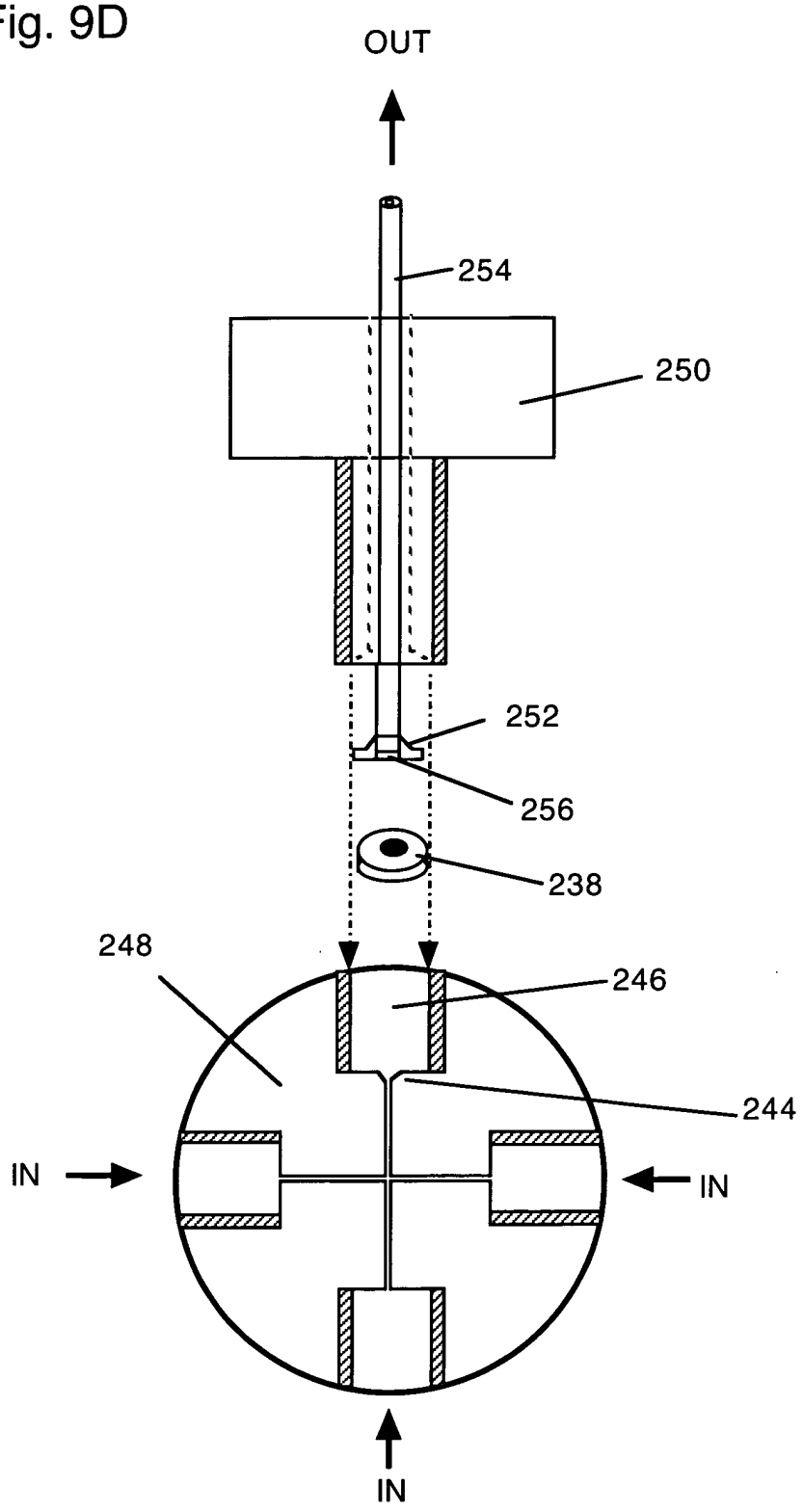


Fig. 10

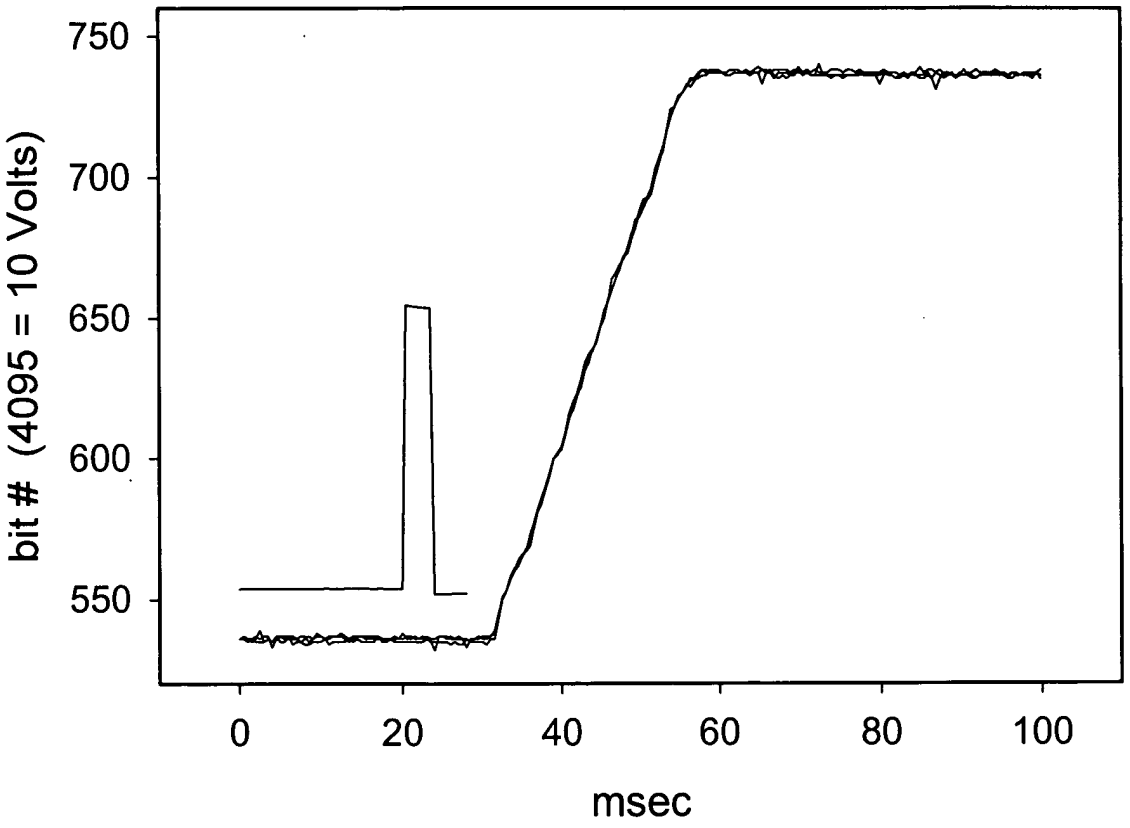


Fig. 11

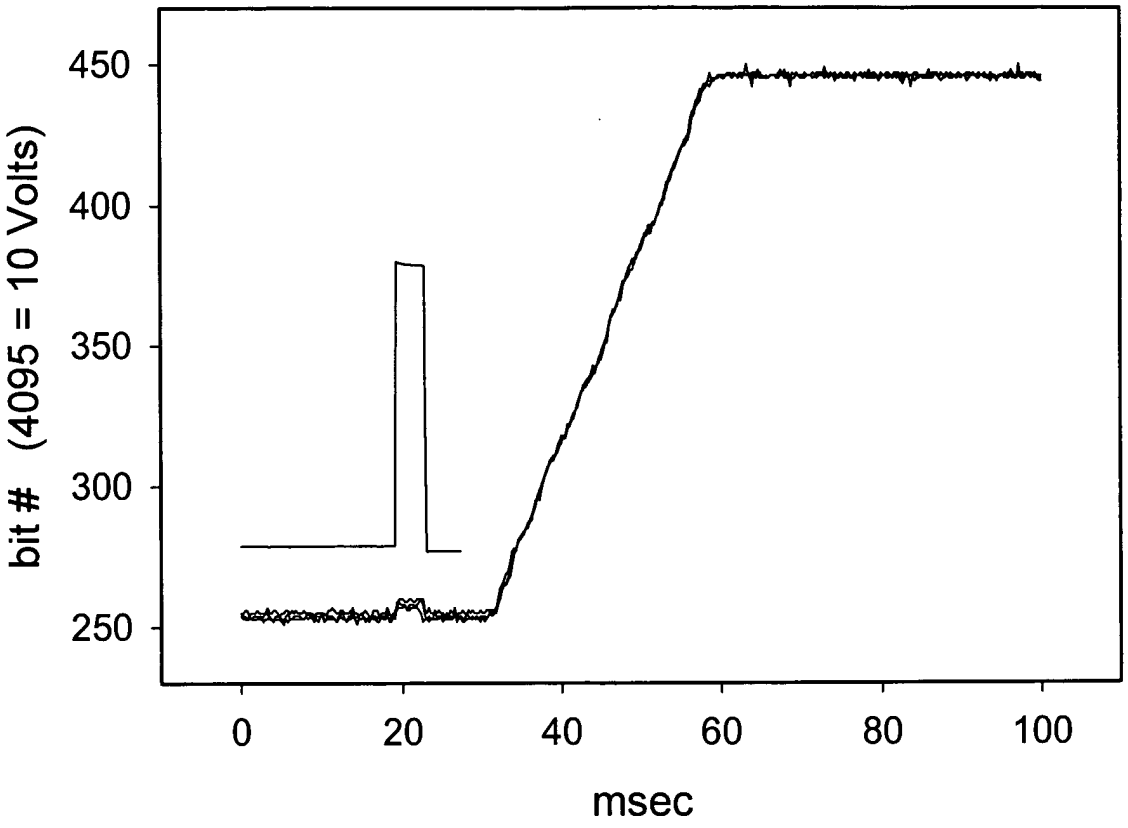
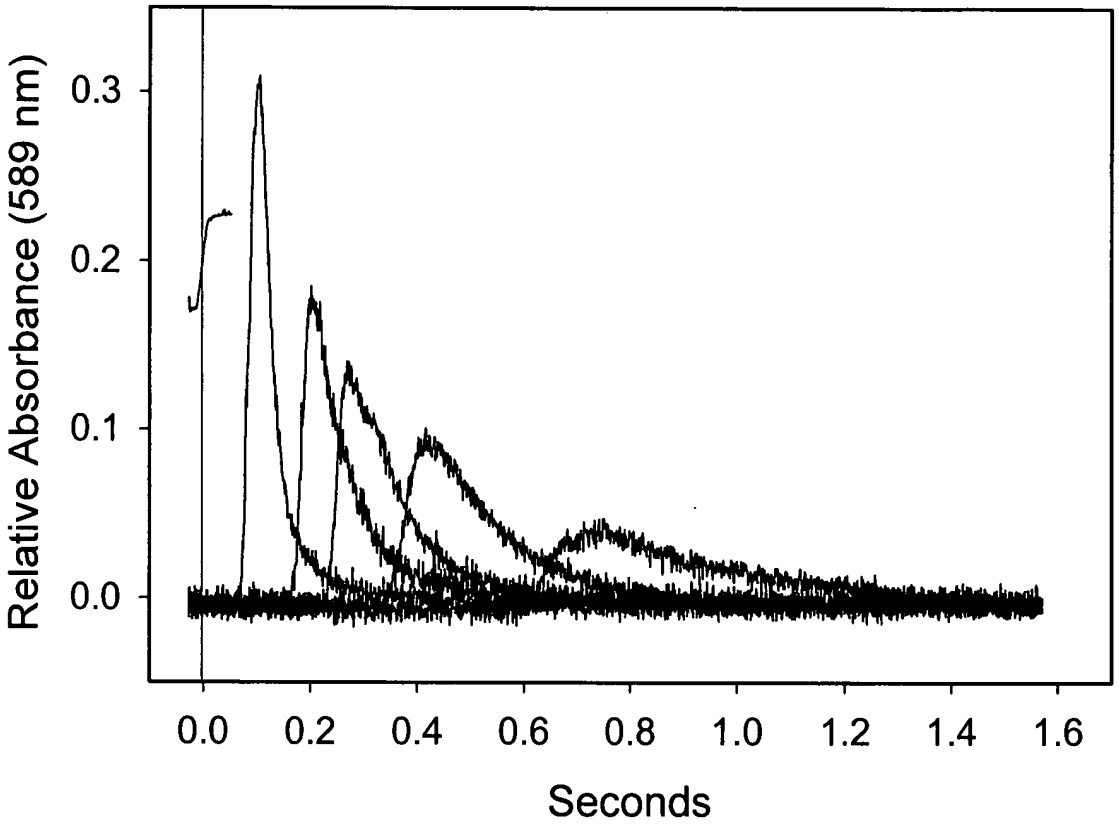


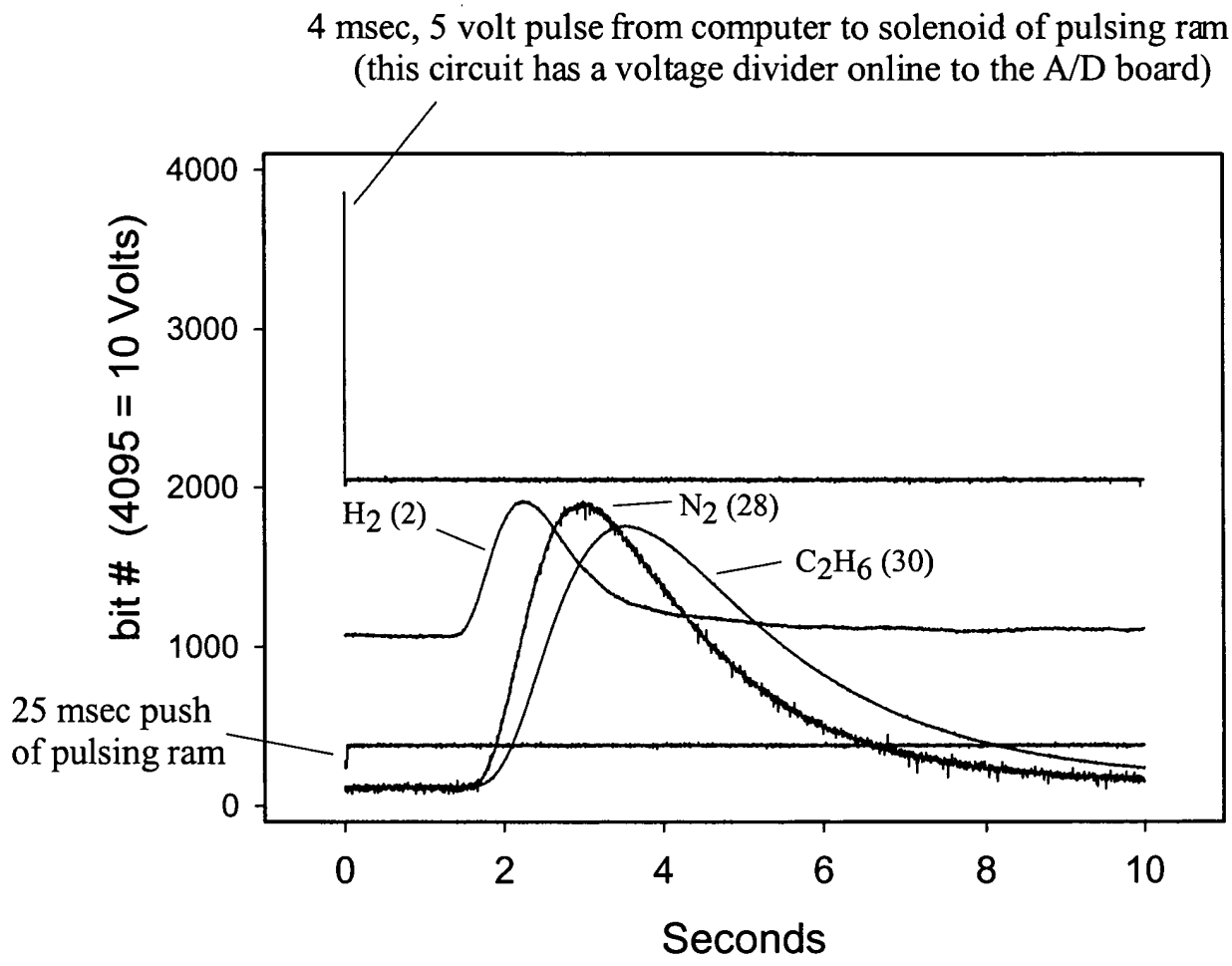
Fig. 12



Conditions:

1) Continuous laminar flow of carrier stream, Reynolds number (Re) = 821.
2) 0.025 second pulse injection of dye, centered at time zero.
3) Dye is bromophenol blue + HCO_3^- in water.
4) Reaction delay lines are 0.020" (0.5 mm) i.d., and of variable lengths.

Fig. 13



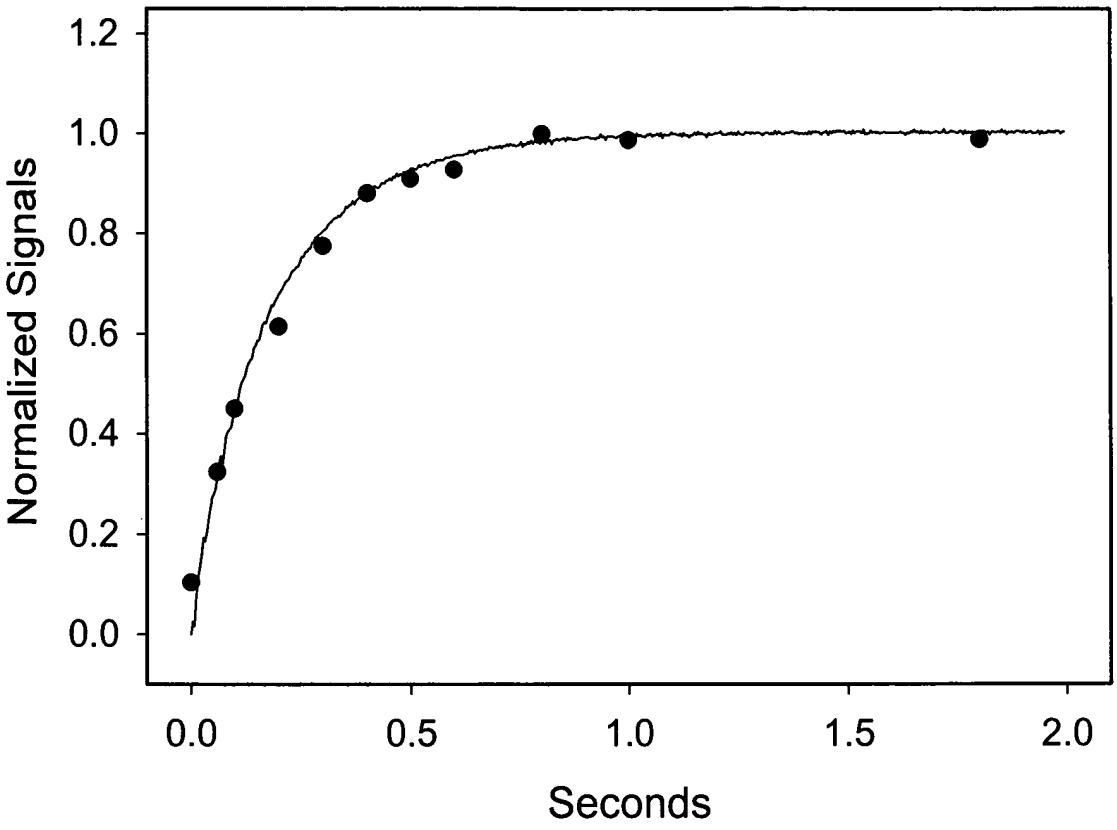
Conditions:

Enzyme syringe: H_2O equilibrated (vol/vol) with 93% N_2, 5% H_2, 2% C_2H_6.
Total pressure = 3.7 atm.
Substrate syringe: Omitted.
Carrier: Argon-sparged H_2O. (No check valve in system.)
Reaction delay line: 2 meters long, 1.7 sec long, 0.022 inch i.d., 1/16 inch o.d., nylon.

Monitoring Five Channels Concurrently:

1) Mass 2 (H_2) at 5 msec intervals.
2) Mass 28 (N_2) at 5 msec intervals.
3) Mass 30 (C_2H_6) at 5 msec intervals.
4) Computer output pulse to relay of ram at 1 msec intervals.
5) Ram displacement (output of linear potentiometer) at 1 msec intervals.

Fig. 14



- CO_2 monitored by push-pause-push membrane inlet mass spectrometry.

—— H^+ by stopped-flow spectrophotometry. Monitoring brom cresol purple at 600 nm.

Fig. 15A

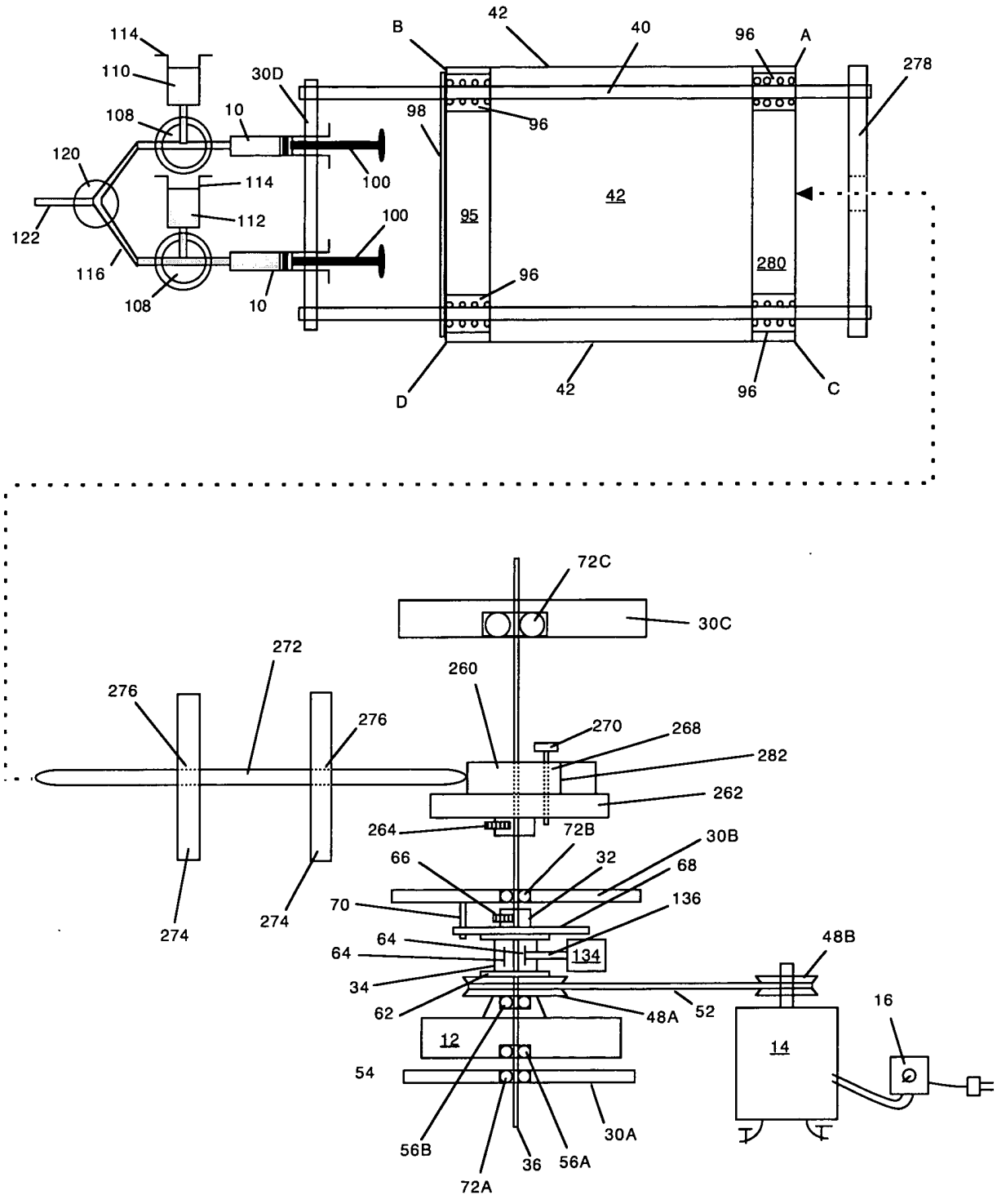

114
110
108
120
122
116
108
10
30D
10
100
114
112
100
B
42
40
96
A
278
98
96
95
42
280
96
D
42
96
C

Fig. 15B

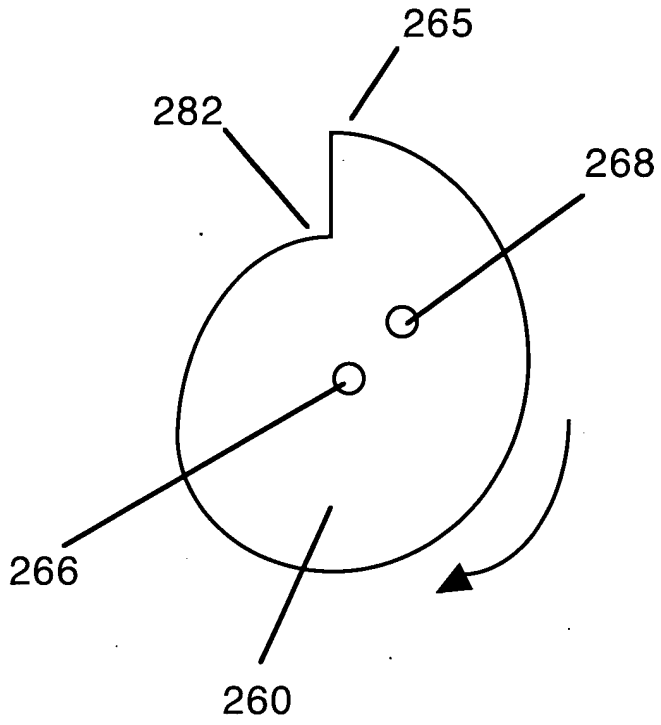


Fig. 16A

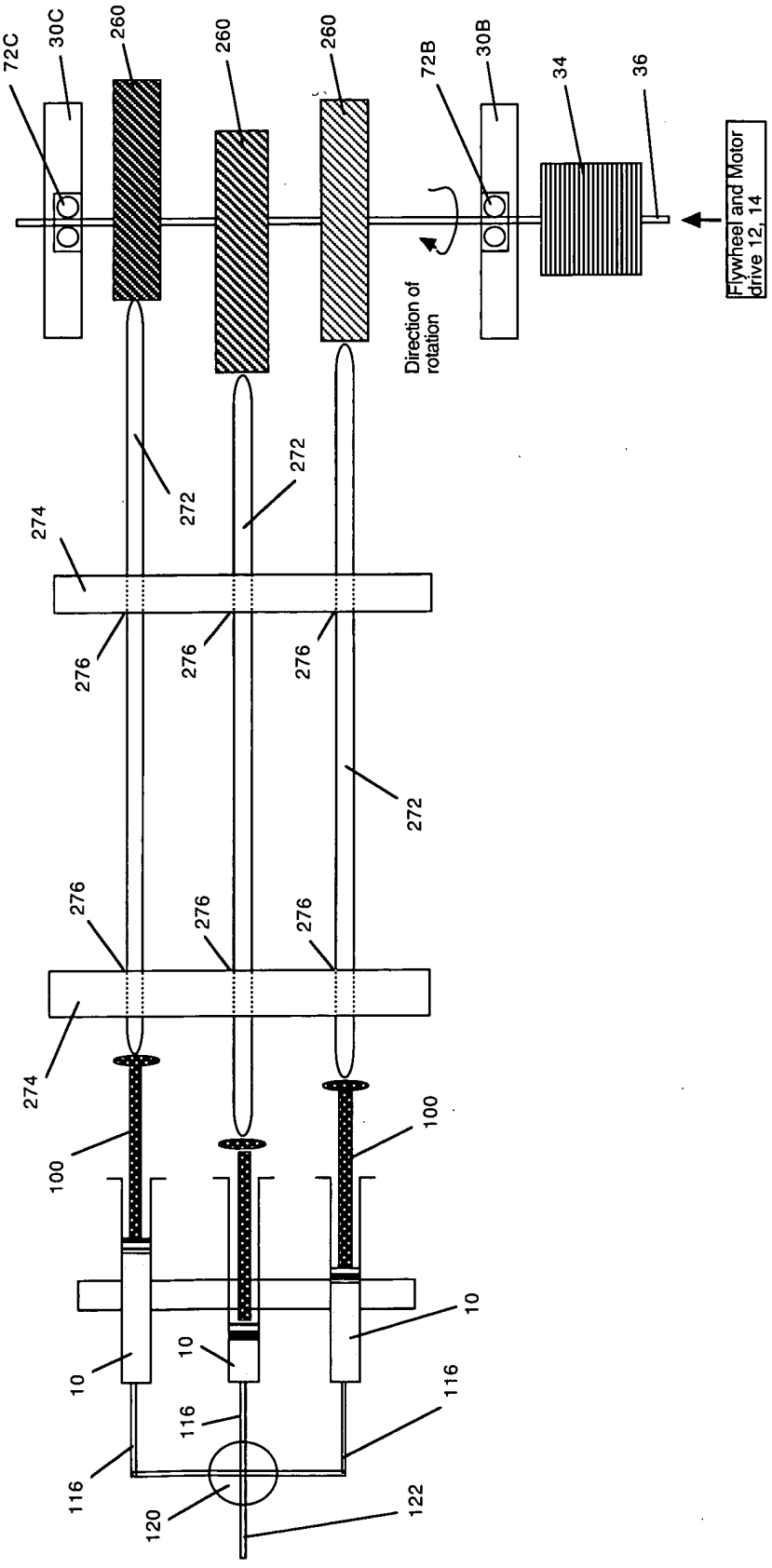
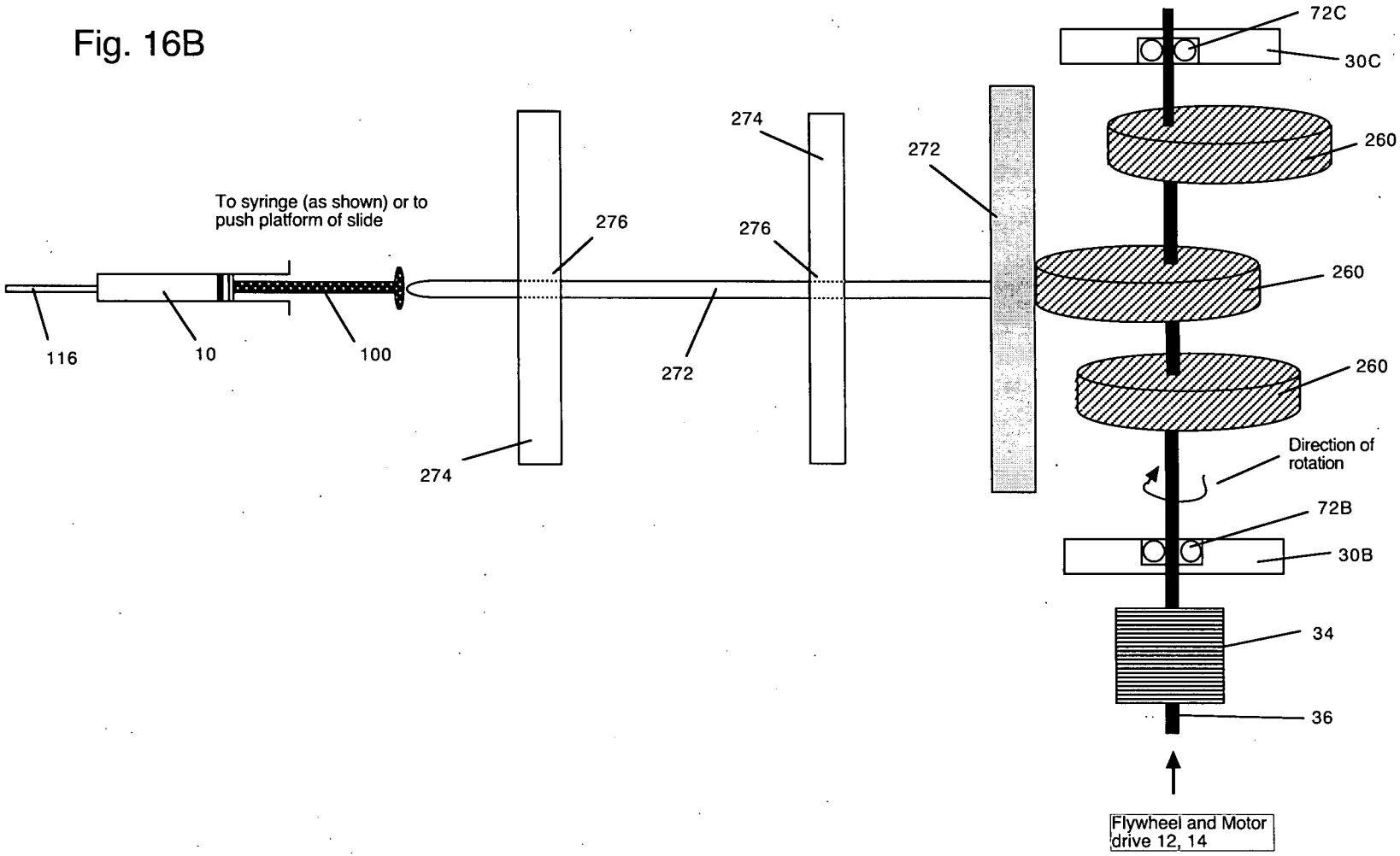

72C
30C
260
260
260
72B
30B
34
36
Flywheel and Motor drive 12, 14
Direction of rotation
272
272
272
274
276
276
276
276
276
276
274
100
100
10
10
10
116
116
116
120
122

Fig. 16B


To syringe (as shown) or to push platform of slide
116
10
100
276
274
272
276
274
272
72C
30C
260
260
260
Direction of rotation
72B
30B
34
36
Flywheel and Motor drive 12, 14